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Necessary and sufficient conditions for emptiness of the cones of generalized support vectors

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Abstract

© 2014, Springer-Verlag Berlin Heidelberg. The purpose of the paper is to establish the conditions which are necessary and sufficient for the cones of generalized (strong, strict) support vectors of a set in a finite-dimensional Euclidean space to be empty. In the present paper, an application of the proposed in J Optim Theory Appl (Gabidullina, J. Optim. Theory Appl. 158(1), 145–171, 2013) linear separability criterion for verification on emptiness or non-emptiness of the cones of GSVs (generalized support vectors) is also studied. We carry out the complete degeneracy analysis of the cones of GSVs for the different kinds of nonempty sets of Euclidean space. We present the different applications of the degeneracy analysis of the cones of GSVs as well.

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Keywords

Cone of generalized strong (strict) support vectors, Coordination, Decomposition, Degeneracy analysis, Linear separability criterion, Minkowski difference of sets, Parallel Computing, Strong (strict) linear separability, Variational inequality